

Exhibit A

1. A hose coupling having an area of peak crimp force, said hose coupling comprising:

an inner sleeve having a first end, a second end opposite said first end, and a pair of annular upset beads therebetween, said inner sleeve further having an inner diameter and an outer diameter thereon, said outer diameter having at least one projection thereon;

a hose having an inner diameter positioned over said outer diameter of said inner sleeve, said at least one projection of said inner sleeve interlocking with said hose to resist axial movement of said hose relative to said hose coupling;

an outer sleeve having a terminating end sandwiched between said pair of annular upset beads of said inner sleeve to prevent axial movement relative to said inner sleeve, said outer sleeve further having an inner diameter circumscribing said hose, said inner diameter of said outer sleeve further including at least one depression therein formed by a crimping operation, said at least one depression interlocking with said hose to further resist axial movement of said hose relative to said hose coupling; and

a reinforcing ring positioned within said inner diameter of said inner sleeve concentric with said area of peak crimp force, such that said reinforcing ring resists deformation of said inner sleeve during said crimping operation.

2. The hose coupling according to claim 1, wherein said second end of said inner sleeve is flared.

3. The hose coupling according to claim 2, wherein said second end of said inner sleeve is received within a second coupling, said second coupling comprising:

a tubular body having an annular upset bead;
a cage axially retained by said annular upset bead; and
a spring disposed within said cage, said second end of said inner sleeve being retained between said cage and said spring of said second coupling.

4. The hose coupling according to claim 1, wherein said reinforcing ring is made of a rigid material.

5. The hose coupling according to claim 4, wherein said reinforcing ring is made of steel.

6. A hose coupling having an area of peak crimp force, said hose coupling comprising;

an inner sleeve having a first end, a second end opposite said first end, and a pair of annular upset beads therebetween, said inner sleeve further having an inner diameter and an outer diameter thereon, said inner diameter having at least one groove therein, said outer diameter having at least one projection thereon;

a hose having an inner diameter positioned over said outer diameter of said inner sleeve, wherein said at least one projection of said inner sleeve interlocks with said hose to resist axial movement of said hose relative to said hose coupling;

an outer sleeve having a terminating end sandwiched between said pair of annular upset beads of said inner sleeve, said outer sleeve further having an inner diameter circumscribing said hose, said inner diameter of said outer sleeve further

having at least one depression formed by a crimping operation, said at least one depression being concentric with said at least one groove of said inner sleeve, wherein said at least one depression interlocks with said hose to further resist axial movement of said hose relative to said hose coupling; and

a reinforcing ring positioned within said at least one groove in said inner diameter of said inner sleeve and concentric with said area of peak crimp force, whereby said reinforcing ring resists deformation of said inner sleeve during said crimping operation, said reinforcing ring having an inner diameter at least as great as said inner diameter of said inner sleeve, whereby said reinforcing ring permits full cross sectional fluid flow through said hose coupling.

7. The hose coupling according to claim 6, wherein said second end of said inner sleeve is flared.

8. The hose coupling according to claim 7, wherein said second end of said inner sleeve is received within a second coupling, said second coupling comprising:

a tubular body having an annular upset bead;
a cage received within and retained by said annular upset bead; and
a spring disposed within said cage, said second end of said inner sleeve being retained between said cage and said spring of said second coupling.

9. The hose coupling according to claim 6, wherein said reinforcing ring is made of a rigid material.

10. The hose coupling according to claim 9, wherein said reinforcing ring is made of steel.

11. A reinforced hose coupling comprising:

a hose having an outer diameter and an inner diameter;
an outer sleeve having an inner diameter circumscribing said outer diameter of said hose, said outer sleeve further having a plurality of depressions therein, said plurality of depressions interlocking with said hose to resist axial movement of said hose relative to said outer sleeve;

an inner sleeve having an inner diameter and an outer diameter, said inner sleeve being adapted to be inserted into said inner diameter of said hose, said inner sleeve having at least one projection interlocking with said hose to resist axial movement of said hose relative to said inner sleeve; and

at least one reinforcing ring situated within said inner diameter of said inner sleeve, said at least one reinforcing ring positioned between said plurality of depressions of said outer sleeve such that said at least one reinforcing ring resists deformation of said inner sleeve.

12. A reinforced hose coupling comprising:

a hose having an outer diameter and an inner diameter;
an outer sleeve having an inner diameter circumscribing said outer diameter of said hose, said outer sleeve further having at least one depression therein, said at least one depression interlocking with said hose to resist axial movement of said hose relative to said outer sleeve;

an inner sleeve having an inner diameter and an outer diameter, said inner sleeve being adapted to be inserted into said inner diameter of said hose, said inner sleeve having at least one projection interlocking with said hose to resist axial movement of said hose relative to said inner sleeve; and

at least one reinforcing ring situated within said inner diameter of said inner sleeve, said at least one reinforcing ring being positioned concentrically with said at least one depression of said outer sleeve such that said at least one reinforcing ring resists deformation of said inner sleeve.



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21133 4610
VANOPHEM MEEHAN & VANOPHEM
755 W BIG BEAVER
SUITE 1313
TROY, MI

48084

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